

AMENDMENTS TO THE CLAIMS

Claim 1 (Currently amended): A method of coupling an organic-a redox-active molecule to a surface of comprising a Group IV element, said method comprising:

halogenating said group IV element surface;

providing a solution comprising said organic-redox-active molecule wherein said organic-redox-active molecule is selected from the group consisting of a porphyrin, an expanded porphyrin, a contracted porphyrin, a ferrocene, a linear porphyrin polymer, a porphyrinic sandwich coordination complex, and a porphyrin array, said redox-active molecule is alcohol terminated, and said alcohol-terminated organic-redox-active molecule is in a solvent; and

contacting said solution with said surface under conditions where said solvent is rapidly removed from said surface whereby said organic-redox-active molecule is coupled to said surface through an E-O bond where E is said group IV element.

Claim 2 (Original): The method of claim 1, wherein said Group IV element is silicon or germanium.

Claim 3 (Canceled).

Claim 4 (Original): The method of claim 2, wherein said surface is a doped silicon surface.

Claim 5 (Original): The method of claim 4, wherein said surface is an n-doped silicon surface.

Claim 6 (Original): The method of claim 4, wherein said surface is a p-doped silicon surface.

Claim 7 (Original): The method of claim 2, wherein said surface is a hydrogen passivated surface.

Claim 8 (Original): The method of claim 2, wherein said contacting is in the presence of a base.

Claim 9 (Original): The method of claim 2, wherein said contacting is in the presence of a base selected from the group consisting of 2,4,6-collidine, 2,6-lutidine, 2,6-di-*tert*-butylpyridine, 4-dimethylaminopyridine, trimethylamine, triethylamine, tributylamine, *N,N*-diisopropylethylamine, 1,8-bis(dimethylamino)naphthalene, 1,5-diazabicyclo[4.3.0]non-5-ene, 1,8-diazabicyclo[5.4.0]undec-7-ene, Na₂CO₃, and NH₃.

Claims 10-12 (Canceled).

Claim 13 (Currently amended): The method of claim 10, wherein said organic-redox-active molecule comprises a porphyrinic macrocycle substituted at a β - position or at a meso- position.

Claim 14 (Currently amended): The method of claim 10, wherein said organic-redox-active molecule comprises a porphyrinic macrocycle containing at least two porphyrins of equal energies held apart from each other at a spacing less than about 50 Å such that said molecule has an odd hole oxidation state permitting the hole to hop between said two porphyrins and wherein said odd hole oxidation state is different from and distinguishable from another oxidation state of said porphyrinic macrocycle.

Claim 15 (Original): The method of claim 2, wherein said contacting comprises selectively applying said solution to certain regions of said group IV element surface and not to other regions.

Claim 16 (Currently amended): The method of claim 15, wherein said contacting comprises:
placing a protective-coating masking material on said surface in regions where said organic molecule is not to be attached;
contacting said solution with the surface; and removing the protective-coating masking material to provide regions of the surface without said organic molecule.

Claims 17-19 (Canceled).

Claim 20 (Original): The method of claim 2, wherein said contacting comprises coating said surface with said solution.

Claim 21 (Canceled).

Claim 22 (Original): The method of claim 2, wherein the alcohol terminated organic molecule is terminated with an alcohol selected from the group consisting of a primary alcohol, a secondary alcohol, a tertiary alcohol, a benzyl alcohol, and an aryl alcohol.

Claim 23 (Currently amended): The method of claim 2, wherein said solvent is a solvent with a boiling point greater than 130°C. high-boiling solvent.

Claim 24 (Original): The method of claim 23, wherein said solvent is selected from the group consisting of mesitylene, durene, *o*-dichlorobenzene, 1,2,4,-trichlorobenzene, 1-chloronaphthalene, 2-chloronaphthalene, *N,N*-dimethylformamide, *N,N*-dimethylacetamide, *N,N*-dimethylpropionamide, benzonitrile, and anisole.

Claim 25 (Original): The method of claim 23, wherein said surface is heated and said solution is applied to said surface whereby said solvent boils off of said surface.

Claim 26 (Original): The method of claim 25, wherein said surface is heated to a temperature of at least about 70°C.

Claim 27 (Original): The method of claim 2, wherein said solvent is applied to said surface and said surface is subjected to a vacuum that boils said solvent off of said surface.

Claim 28 (Original): The method of claim 2, wherein said halogenating comprises contacting said surface with a halogen selected from the group consisting of iodine, bromine, fluorine, and chlorine.

Claim 29 (Original): The method of claim 28, wherein said halogenating comprises contacting said surface with iodine.

Claim 30 (Original): The method of claim 28, wherein said halogenating comprises contacting said surface with a reagent selected from the group consisting of *N*-bromosuccinimide, *N*-chlorosuccinimide, *N*-iodosuccinimide, ICl, SO₂Cl₂, BrCCl₃, PCl₅, CBr₄, Br₂ + HgO, MoCl₅, CF₃OF, AgSbF₆, PhSe(O)Cl, AlCl₃, AlBr₃, and Cl₂O.

Claim 31 (Canceled).

Claim 32 (Original): The method of claim 31, wherein said halogenating comprises contacting said surface with a free radical initiator selected from the group consisting of UV light, benzoyl peroxide, and AIBN (2,2'-azobisisobutyronitrile).

Claims 33-98 (Canceled).